MEC
User Manual

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List of Contents

1 Safety information 6
2 About the MEC 7
2.1 MEC variants available 7
3 Installation 8
3.1 Physical mounting 8
3.2 Gas connections 9
3.3 Electrical connections (External) 10
3.4 Electrical connections (Internal) 10
4 Operation 11
5 Oxygen cell replacement 12
6 General care 14
7 Calibration 15
8 Specification 16
9 Warranty Information 17
10 Disposal 18

1 Safety information

WARNING: Read the safety information fully before using the **Analox MEC**.

Electrochemical oxygen sensor

The oxygen sensor used in MEC Oxygen variant is an electrochemical sensor which contains toxic compounds. Under normal conditions the sensor will be safely sealed. To prevent leakage, the unit must not be exposed to temperatures outside the specified range, or be exposed to organic vapours, which may cause physical damage to the body of the sensor. The unit must not be stored in areas containing organic solvents or in flammable liquid stores.

When the life of the sensor has expired or it is leaking or otherwise damaged it must be disposed of safely in accordance with local regulations.

The sensor contains an acidic electrolyte which is hazardous. In the event of an accident, use the following first aid procedures

Body Part	Effect	First Aid Procedures
Skin	Contact could result in a chemical burn. Persons with pre-existing skin disorders may be more susceptible to the effects of the substance.	Immediately flush the skin thoroughly with water for at least 15 minutes. Remove contaminated clothing and wash before re-use. Obtain medical advice if continued irritation.
Ingestion	Corrosive. May cause sore throat, abdominal pain, nausea, and severe burns of the mouth, throat, and stomach, and may be fatal.	If swallowed DO NOT INDUCE VOMITING. Wash out mouth thoroughly with water and give plenty of water to drink. Obtain medical advice immediately
Eye	Persons with pre-existing eye problems may be more susceptible to the effects of the substance. Corrosive. May cause redness, pain, blurred vision, and eye burns. Contact can result in the permanent loss of sight.	Irrigate thoroughly with water for at least 15 minutes. Obtain medical advice immediately.
Inhalation	Persons with pre-existing impaired respiratory function may be more susceptible to the effects of the substance. Inhalation is not an expected hazard unless heated to high temperatures. Mist or vapour inhalation can cause irritation to the nose, throat, and upper respiratory tract.	Remove to fresh air. Rest and keep warm. Obtain medical advice if applicable.

2 About the MEC

The Analox MEC is a small, robust sensor module housed in an IP65 enclosure.
An integral pressure sensor provides compensation for the effects of atmospheric pressure.
Digital communication via RS485 permits mounting the sensor up to 500m from the monitoring equipment.
The Analox MEC allows for easy replacement of sensor cells.

This manual details the use of the Analox MEC with the Analox SDA.

2.1 MEC variants available

The Analox MEC is available in the variants shown in Table 1 below:

Gas	Range	In / out of chamber	Part Number
Oxygen	0 to 100%	Outside chamber	MECO2ABB
Oxygen	0 to 3000mBar	In chamber	MECO2AABP

Table 1

3 Installation

3.1 Physical mounting

The sensor is housed in an IP65 ABS box with integrated mounting holes. The instrument should be screwed to a suitable surface using the two mounting holes. The drill drawing for mounting the enclosure is shown in Figure 1 below.

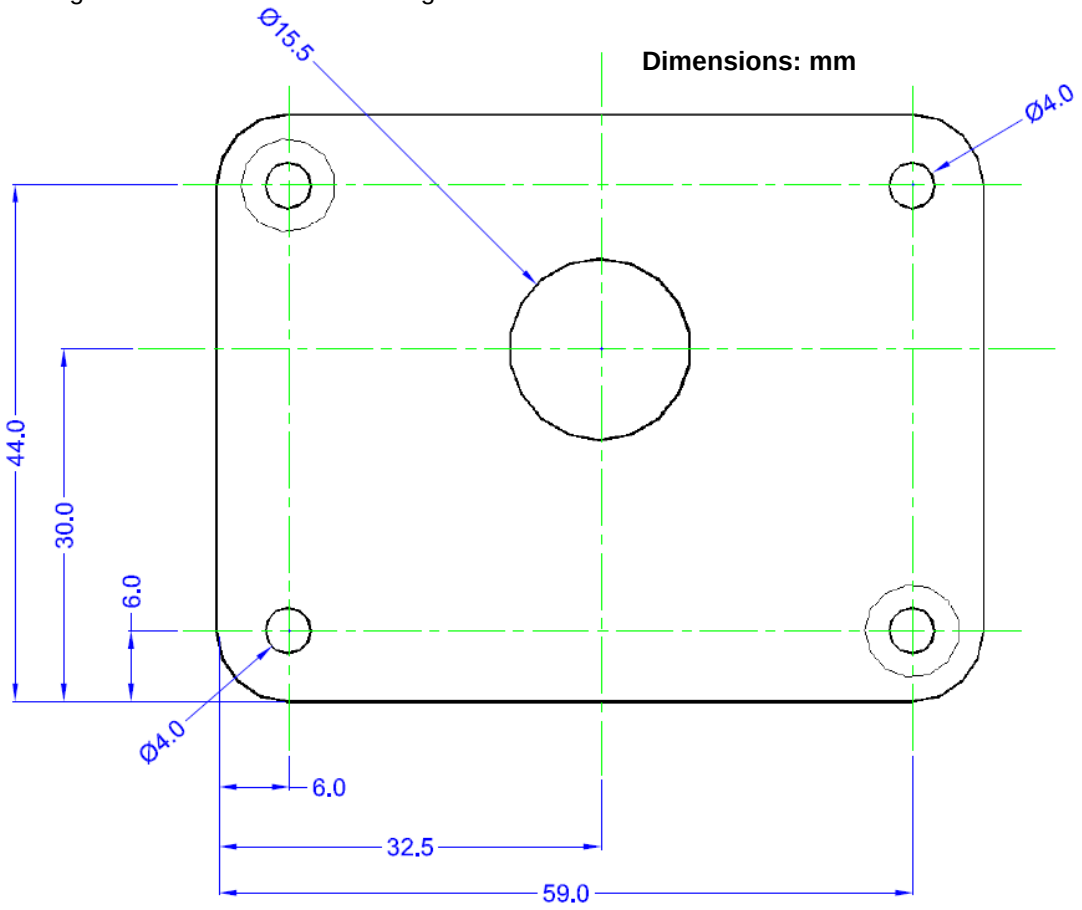
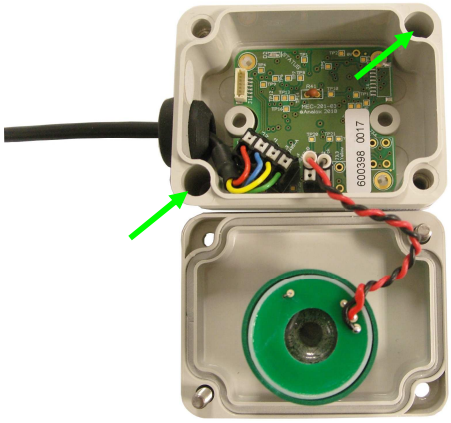


Figure 1 – Mounting drill drawing

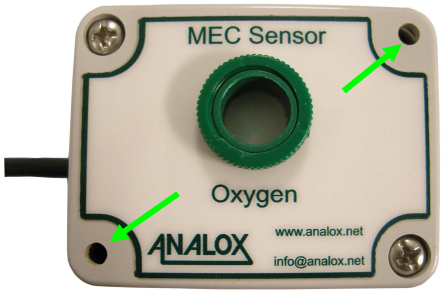
The enclosure lid holes are located in the top left and bottom right of the enclosure. The enclosure lid screws are captive screws.

The mounting holes of the enclosure are located at the top right and bottom left of the enclosure. A 4mm hole is pre-drilled at these corners that will accept an M4 screw thread. For the initial installation the enclosure lid should be removed to access the mounting hole chambers. The mounting screws are fitted in to these and the enclosure can then be secured to a suitable surface using either tapped holes or nuts. The maximum allowable diameter of the screw head that can be fitted in to the mounting hole chambers is 6.5mm.



Mounting hole chambers

In the lid at the mounting hole corners there are 4mm access holes predrilled to allow the mounting screws to be accessed. Once mounted, this enables the MEC to be removed from its mounting position without needing to remove the enclosure lid. The mounting screws will then remain captive as long as the lid remains fitted.



Mounting screw access holes

3.2 Gas connections

The sensor may either monitor gas in the surrounding atmosphere or a flow adapter can be inserted into the gas port inlet to allow monitoring of pumped sample gas from a remote location.

When used to monitor a pumped sample, Analox recommend that a short length (100 to 300mm) of tubing should be attached to the flow adapter exhaust. Care should be taken to ensure that the sample flow rate is within specification (0.2 to 1.0 litres/minute) and that the exhaust line is not restricted, otherwise gas pressure within the sensor may be increased, resulting in false, elevated O2 readings or damage to the cell.

Monitoring local atmosphere

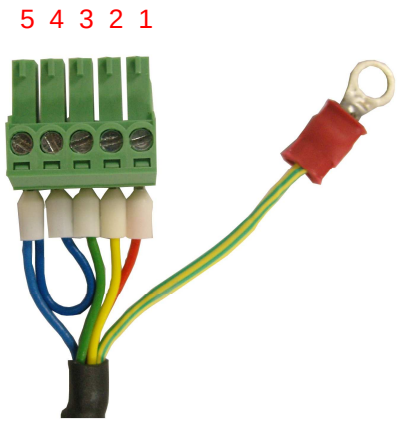
Monitoring a remote atmosphere via a sample line

3.3 Electrical connections (External)

Electrical connections with the sensor are made via a short screened cable. The cable screen is made off into a green/yellow wire terminated with an M4 ring terminal. This wire is un-terminated inside the MEC enclosure.

TERMINAL	CORE COLOUR	SIGNAL	DETAILS
1	Red	+SUPPLY	Power Supply 4.5 to 5.5V DC
5	Blue	-SUPPLY	
4	Blue	RS485 reference	Used for 3-wire connection
2	Yellow	RS485A	RS485 communications
3	Green	RS485B	
	Green/Yellow	Earth	Screen

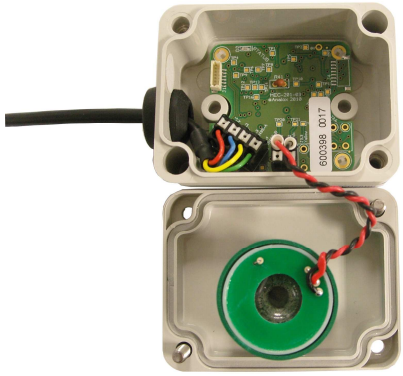
Table 2



Use of the screen will depend on the particular installation. It is best connected to a clean Earth to form a shield around the sensor cable. Note that it is not recommended for the screen to be connected to the negative supply line.

3.4 Electrical connections (Internal)

The electrical connections made to the internal electronics are made via clamp terminals. It is important to ensure that each core or the cable is connected to the correct terminal. Shown below are the correct electrical connections for the power/comms and Oxygen cell.



4 Operation

The MEC connects to the sensor port of the SDA as shown below.
The 5-way terminal block is connected to the SENSOR socket and the Screen should be connected to the earth stud of the of the SDA enclosure.

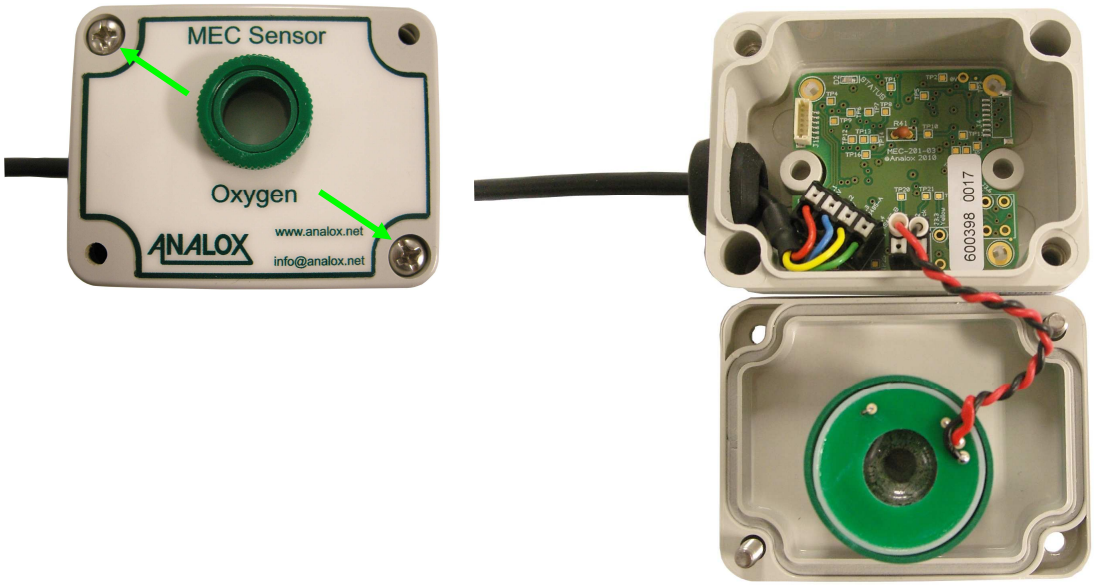
Once the MEC and SDA are connected communication between them will automatically be established.
For further details of operation of the MEC with the SDA refer to the SDA user manual (XK0-801).

5 Oxygen cell replacement

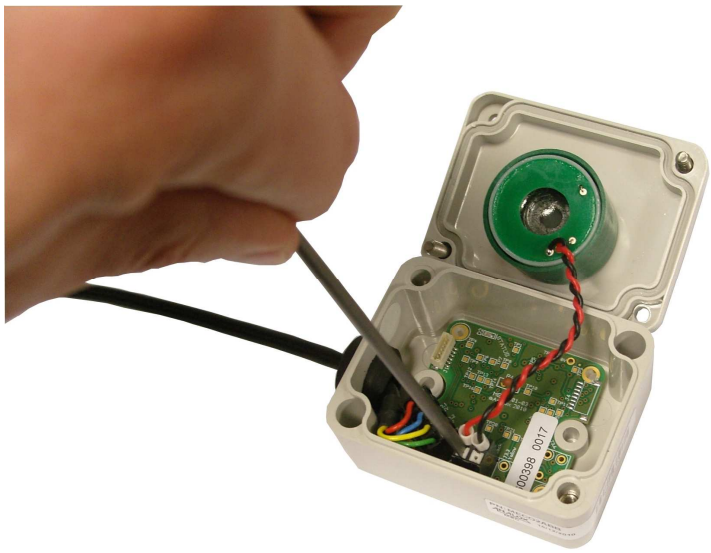
1. Replacement part number for your cell is: 9100-9212-9HM
   When a replacement cell is received check that the sensor has not leaked. The sensors are themselves sealed and do not under normal circumstances present a health hazard however if leakage of the electrolyte has occurred use rubber gloves and wear chemical splash goggles to handle and clean up. Rinse contaminated surfaces with water. If anybody comes into contact with the electrolyte, please refer to Section 1.

2. Ensure all electrical connection between the MEC and monitor equipment are disconnected.

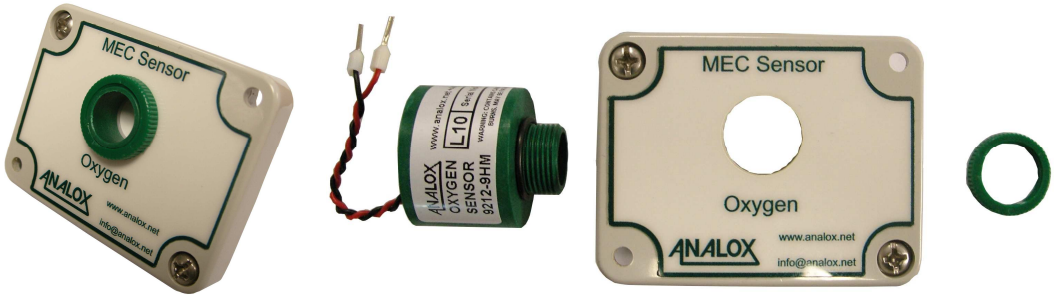
3. Loosen the corner screws of the enclosure and remove the lid.



4. Using a terminal screwdriver push down the clamp release button to release the clamp and gently pull the cell wire from the clamp. Repeat this for both the red and black wires.

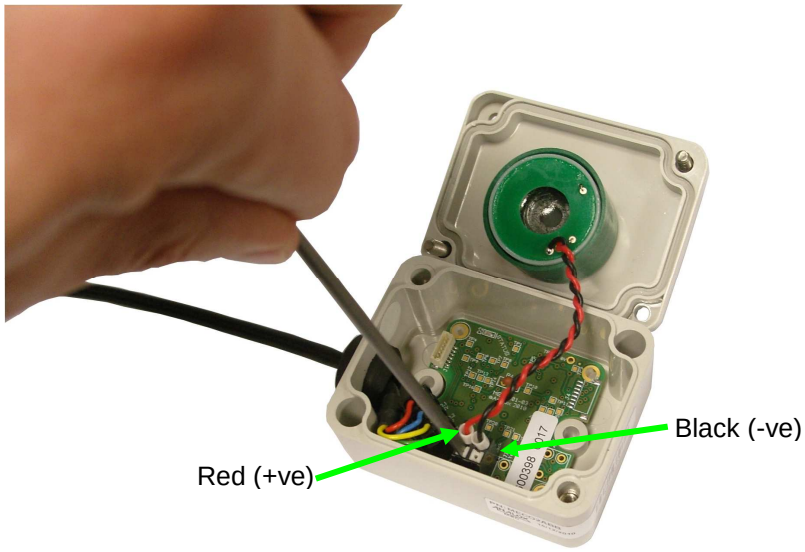


5. Unscrew the green lock ring from the chimney of the cell housing and remove from the enclosure lid.



6. Fit the new cell in to the enclosure lid and secure in place using the lock ring.

7. Using a terminal screwdriver push down the clamp release button to release the clamp. Push the ferrule of the cell wire in to the clamp and remove the screwdriver from the clamp release button. Gently pull on the wire to ensure that the wire is held by the clamp. Repeat this for both the red and black wires, taking note of the correct polarity as shown below.



8. Refit the enclosure lid in place and secure in place using the corner screws.

9. Following an Oxygen cell replacement a full calibration MUST be performed. For further details of calibration of the MEC refer to the SDA user manual (XK0-801).

6 General care

Although designed to be water resistant the MEC should not be intentionally immersed in liquid or left outside unprotected.

To clean the MEC use a damp soft cloth.

7 Calibration

The calibration of the MEC is performed using the user interface of the SDA. For details of calibration procedures refer to the SDA user manual (XK0-801).

8 Specification

These units comply with the requirements of DNV for use in commercial diving to a depth of 350m and across the following variations in environmental conditions.

Sensor range (Atmospheric pressure)	0 to 100%
Sensor range (Hyperbaric)	0 to 3000mBar
Temperature range	-5℃ to 55℃ (23℉ to 131℉)
Ambient pressure	600mbar to 1400mbar (525.0mmHg to 975.1mmHg)
Humidity	0 to 99% non-condensing
Accuracy	The sensor error is less than 350ppm plus 1% of the sensor reading at constant temperature. The variation with temperature is less than 0.15% of reading /℃.
Supply voltage	4.5V to 5.5V dc
Data output	RS485 using Analox protocol
Enclosure dimensions (H x W x D)	65 x 50 x 35 mm
Remote sensor gas flow rate	0.2 to 1.0 litres/minute

9 Warranty Information

We provide the following Warranties for the MEC:

A 1 year electronics warranty.
A 2 year graded sensor warranty.

In both cases the warranty period runs from the date of our invoice.

We warrant that the equipment will be free from defects in workmanship and materials.

The warranty does not extend to and we will not be liable for defects caused by the effects of normal wear and tear, erosion, corrosion, fire, explosion, misuse, use in any context or application for which the equipment is not designed or recommended, or unauthorised modification.

Following a valid warranty claim in accordance with the above, the equipment, upon return to us, would be repaired or replaced without cost or charge but in our discretion we may elect instead to provide to you which ever is the lesser of the cost of replacement or a refund of net purchase price paid as per our Invoice on initial purchase from us. We shall have no liability for losses, damages, costs or delays whatsoever. We shall have no liability for any incidental or consequential losses or damages. All express or implied warranties as to satisfactory or merchantable quality, fitness for a particular or general purpose or otherwise are excluded and no such Warranties are made or provided, save as set out in this Clause 7.

In order to effectively notify a warranty claim, the claim with all relevant information and documentation should be sent in writing to:

Analox Ltd
15 Ellerbeck Court
Stokesley Business Park
Stokesley
North Yorkshire
TS9 5PT

Or by e-mail to : info@analox.net
Or by Fax to : +44 1642 713900

We reserve the right to require from you proof of dispatch to us of the notification of warranty claim by any of the above alternative means.

The equipment should not be sent to us without our prior written authority. All shipping and Insurance costs of returned equipment are to be born by you and at your risk. All returned items must be properly and sufficiently packed.

10 Disposal

According to WEEE regulation this electronic product can not be placed in household waste bins. Please check local regulations for information on the disposal of electronic products in your area.